

ABSTRACT OF THE DISCLOSURE

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A process for the production of a liquid hydrocarbon oil from a gas feed containing a lower hydrocarbon and CO₂, wherein the gas feed is mixed with H₂O to obtain a mixed gas having specific CO₂, H₂O and lower hydrocarbon contents.

10 The mixed gas is contacted with a Rh, Ru/MgO catalyst having a specific surface area of 5 m²/g or less to produce a synthesis gas with a carbon conversion efficiency Cf of at least 50 %. The thus obtained synthesis gas having a H₂/CO molar ratio of 1.5-2.5 is
15 reacted in the presence of a Fischer-Tropsch catalyst to obtain a liquid hydrocarbon oil, while the synthesis gas having a H₂/CO molar ratio of 0.5-1.5 is reacted in the presence of one or more catalysts having methanol synthesizing, dehydrating and CO shift reaction activities
20 to obtain dimethyl ether.